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# VALVE IN VALVE: THREE-DIMENSIONAL TRANSOESOPHAGEAL ECHOCARDIOGRAM AND MULTI-SLICE CT IMAGES OF BIO-PROSTHETIC AORTIC VALVE REPLACED BY MEDTRONIC COREVALVE

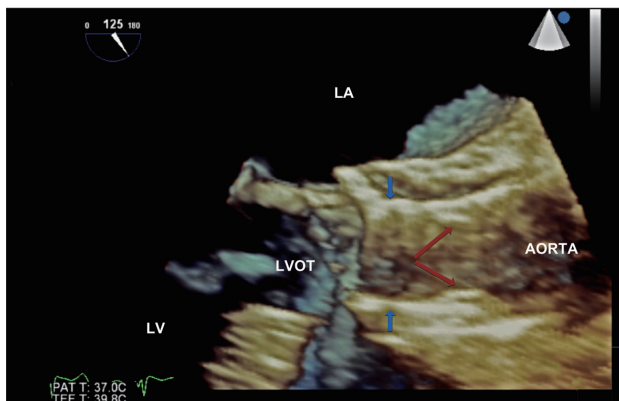
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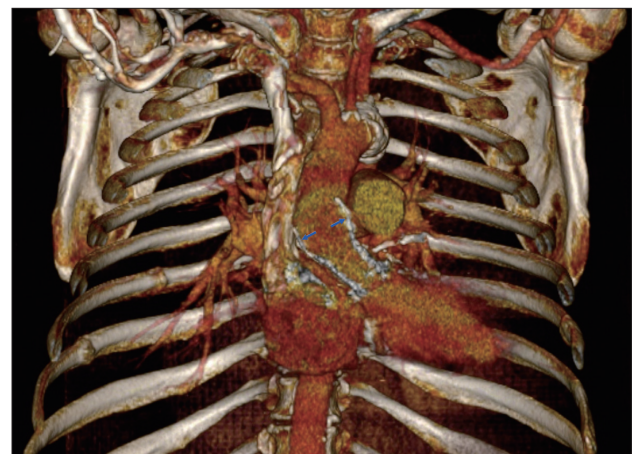
**KEY WORDS:** TAVI · Medtronic CoreValve · Computed tomography · 3D TEE.

Valve-in-valve trans-cutaneous aortic valve implantation (TAVI) is now feasible and in a recent multi-centre study showed performed with high technical success rates, acceptable post-procedural valvular function, and excellent functional improvement.<sup>1)</sup> Multi-modality cardiac imaging in such patient's is slowly becoming routine and it is becoming pivotal for physicians to recognize structural and anatomical changes present in such patients. A 70-year-old gentleman was admitted to our unit with pyrexia and suspected infective endocarditis. He had

previously undergone bio-prosthetic aortic valve implantation in 2004 for aortic stenosis. When he re-presented with heart failure in 2012 due to re-stenosis of the aortic valve bio-prosthesis, he was deemed not suitable for re-do surgery because of high-risk involved. Thus, he had TAVI using Medtronic CoreValve. Three-dimensional transoesophageal echocardiogram (3D TEE) and multi-slice contrast enhanced computed tomography (CT) scan were performed to look for the source of infection. 3D TEE clearly showed the groove of CoreValve in



**Fig. 1.** Three-dimensional transoesophageal view of Medtronic CoreValve (blue arrows) embedded in sinus of Valsalva, where bio-prosthetic aortic valve was previously implanted. In this systolic view the CoreValve cusps are open (red arrows). LA: left atrium, LV: left ventricle, LVOT: left ventricular outflow tract.

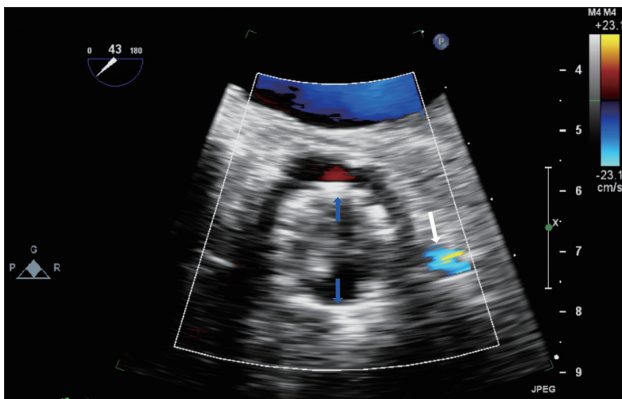


**Fig. 2.** Computed tomography three-dimensional multi-slice reconstruction showing well-seated CoreValve strut (blue arrows) in the left ventricular out-flow tract to aortic root.

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**Fig. 3.** Colour Doppler view in two-dimensional short-axis transoesophageal aortic valve plane showing the strut of Medtronic CoreValve (blue arrows) and demonstrating clear flow in the left main stem (white arrow).

aortic sinus and that it was well seated (Fig. 1). Position and location of the CoreValve was also confirmed on CT thorax with

3D vascular multi-slice reconstruction (Fig. 2). Two-dimensional short-axis colour Doppler views confirmed patent left main stem and location of the strut in relation to it (Fig. 3). The highlight of this peculiar case is that the CoreValve can be recognised by 3D TEE and also CT. However, it is not possible to distinguish the remnant leaflets of the previous bio-prosthesis. This is important to bear in mind when performing and reporting TEE and CT in patients with aortic valve in valve systems. To best of our knowledge, this state-of-the-art 3D-volume rendered multi-modality imaging assessment of valve in valve TAVI has not been reported previously in literature.

## REFERENCE

1. Eggebrecht H, Schäfer U, Treede H, Boekstegers P, Babin-Ebell J, Ferrari M, Möllmann H, Baumgartner H, Carrel T, Kahlert P, Lange P, Walther T, Erbel R, Mehta RH, Thielmann M. *Valve-in-valve transcatheter aortic valve implantation for degenerated bioprosthetic heart valves.* *JACC Cardiovasc Interv* 2011;4:1218-27.